New Species of the Genus *Dorylocratus* with Notes on Their Behavior[1]

(Coleoptera : Staphylinidae)

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The genus *Dorylocratus* Wasmann was recently redescribed and its phylogenetic affinities with *Dorylomimus* Wasmann and *Jeanneliusa* Bernhauer were documented by Seevers (1964). It is therefore the purpose of this paper to redescribe the only previously known species and to describe two new species, one of which was collected recently in Liberia and another based on a specimen in the collections of the Musée Royal de l'Afrique Centrale, Tervuren, which was formerly determined as *Dorylocratus rex* Wasmann. Specimens of this genus are rare in collections and seem to be rare in nature also. For this reason the small number of behavioral notes we were able to record will be given here.

ACKNOWLEDGMENTS

The author wishes to thank Mr. P. Basilewsky, Curator and Chief of the Entomology Section of the Musée Royal de l'Afrique Centrale, Tervuren, for the loan of the specimen which formed the basis of *D. kisantuensis* Kistner, n. sp., Professor J. K. A. Van Boven, Université de Louvain, for the determination of the ants, and Mr. Al Muto, Chico State College, for the translation of the Patrizi (1951) paper from Italian to English.

KEY TO SPECIES

1. Color reddish brown; posterior projections of the head directed mostly upward so that the head appears rounded behind the eyes (Figs. 4 and 5) when viewed from the dorsal side ..... *rex* Wasmann
   Color dark reddish brown, approaching black; posterior projections of the head directed both upward and posteriorly so that the head appears bulbous behind the eyes when viewed from the dorsal side (Figs. 1 and 2) 2
2. Head with a raised carinate projection on the posterior median line between the two posterior projections (Figs. 1 and 2) ..... *regina* Kistner
   Head without such a raised carinate projection, with the head evenly rounded between the two posterior projections ..... *kisantuensis* Kistner

DORYLOCRATUS REX Wasmann

(Figs. 4–6, 7–8)

Dorylocratus rex Wasmann, 1916, p. 100, Plate 3, figs. 3, 3a. Naturhistorisches Museum, Maastricht (Congo Republic: St. Gabriel near Stanleyville, from 3 separate columns of *Dorylus* (*Anomma*) *wilverthi* Emery) ; 1917, p. 281, Plate 8, figs. 14–20.

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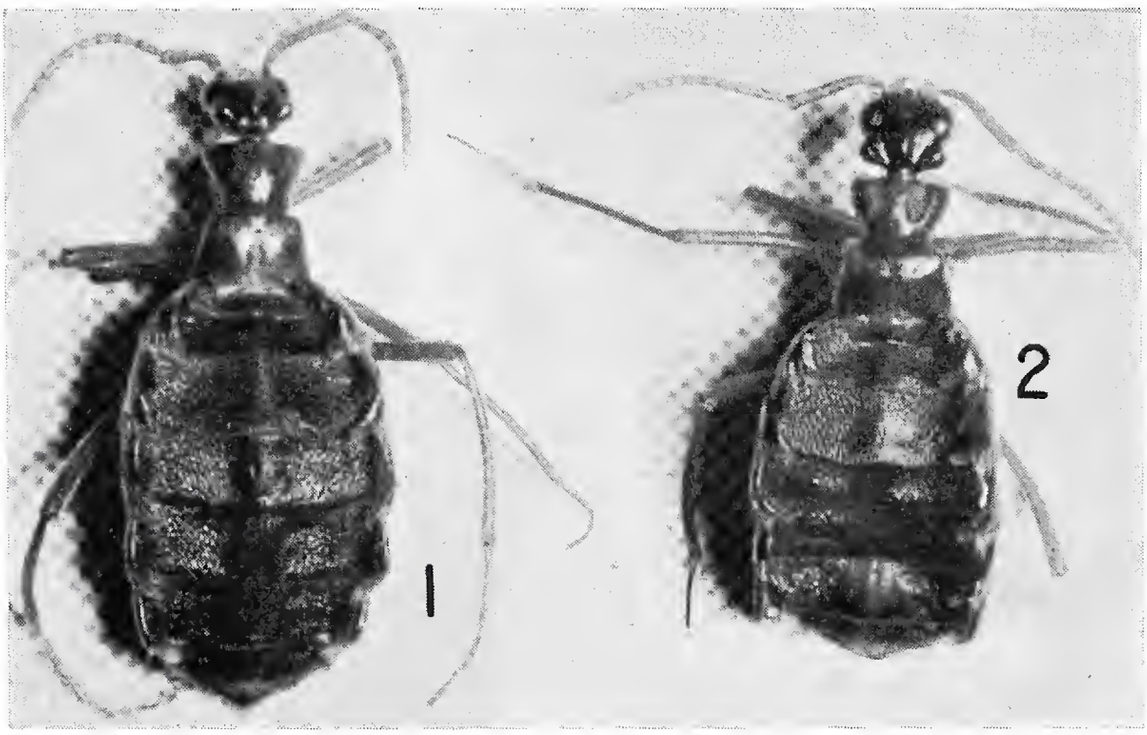
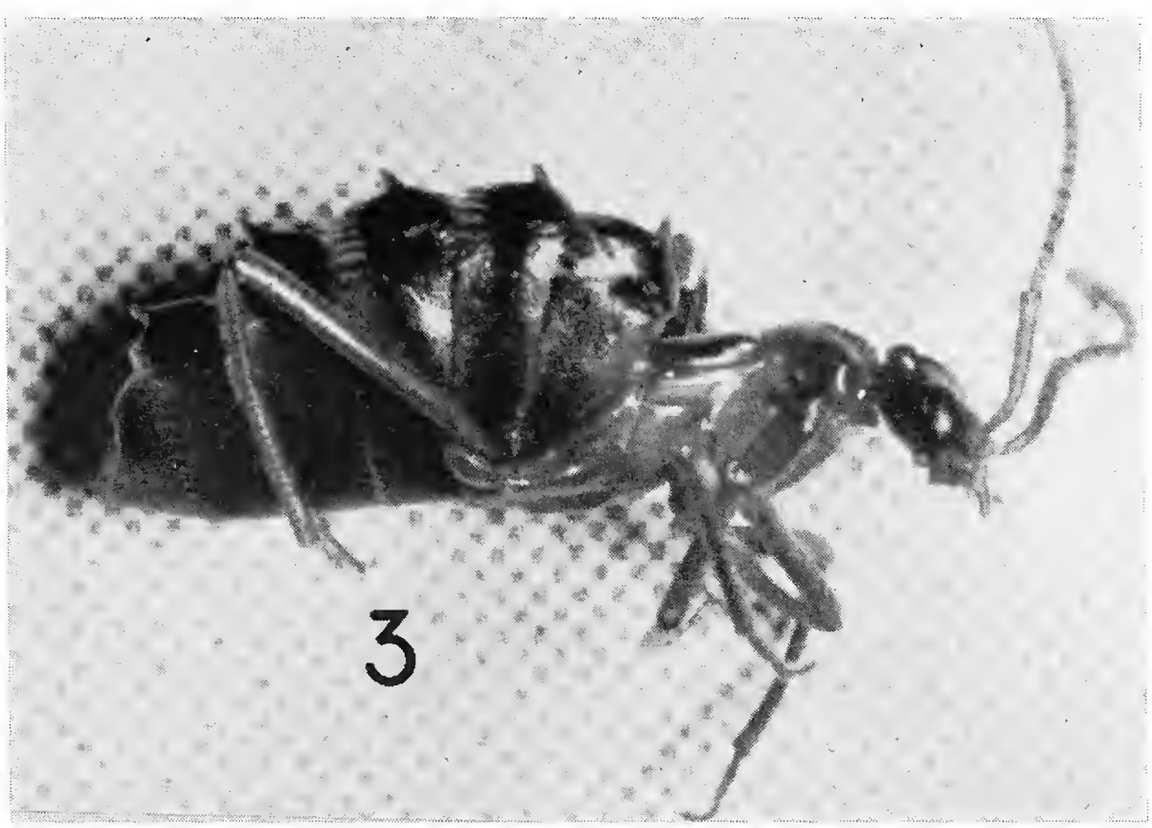


EXPLANATION OF FIGURES

Figs. 1–2. *Dorylocratus regina* Kistner. 1, female, dorsal view. 2, male, dorsal view. Square dots in the background have a side equal to 0.15 mm.



EXPLANATION OF FIGURE

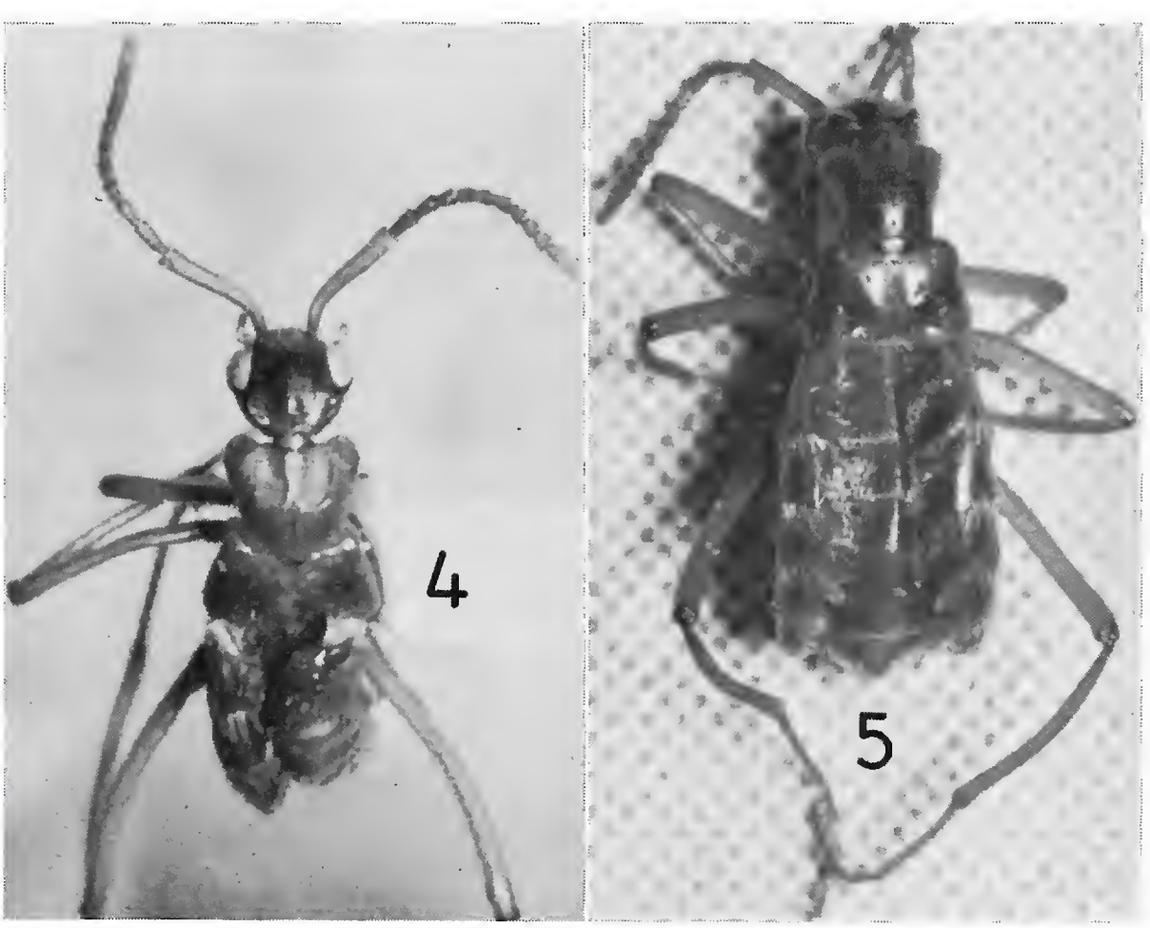
Fig. 3. Lateral view of female *Dorylocratus regina* Kistner. Square dots in the background have a side equal to 0.15 mm.

Distinguished from all other species by the color, the shape of the posterior cephalic prominences, and the shape of the male genitalia.

Color light reddish brown throughout; abdomen somewhat darker. Dorsal surface of the head, pronotum, and elytra with extremely fine bumps scattered sparsely and evenly over them except in the pronotal fossae where the fine bumps are closer together, giving a duller overall appearance. Pronotum with a dark line running longitudinally along the midline; this line is darkest behind the fossae but can be traced forward to a point just short of the anterior border. Posterior cephalic prominences feebly developed upward and backward, but scarcely modify the outline of the head when viewed from the dorsal side (Figs. 4 and 5). Surface of the head between the two lateral prominences forming a carinate (but flattened) dorsal projection. Overall dorsal appearance of female as in Fig. 4. Overall dorsal appearance of male as in Fig. 5. Lateral appearance of male as in Fig. 6. Male genitalia shaped as in Fig. 7. Spermatheca of female shaped as in Fig. 8.

Measurements.—Pronotum length, 0.90–0.91 mm; elytra length, 0.60 mm; head length, 0.92–0.93 mm.

Material examined.—Congo Republic: Yangambi, collected by D. H. and A. C. Kistner and R. Banfill: one female, 27 June 1960, from the central part of an emigration column of *Dorylus* (*Anomma*) *wilverthi* Emery, nest No. 14; one male, 29 June 1960, from the central part of a



EXPLANATION OF FIGURES

Figs. 4–5. *Dorylocratus rex* Wasmann. 4, female, dorsal view. 5, male, dorsal view. Square dots in the background have a side equal to 0.15 mm.

raiding column of *D. wilverthi* Emery, nest No. 18. In the collection of D. H. Kistner.

Dorylocratus regina Kistner, new species

(Figs. 1–3, 9–10)

Distinguished from all other species by the color, the shape of the posterior cephalic prominences, the shape of the median posterior carina of the head, and the shape of the male genitalia.

Color dark reddish brown throughout; abdomen somewhat darker, approaching black. Dorsal surface of the head, pronotum, and elytra with extremely fine bumps scattered sparsely and evenly over them except in the pronotal fossae where the fine bumps are closer together giving a duller overall appearance. Pronotum with a dark line running longitudinally along the midline; this line is darkest behind the fossae but can be traced forward to a point just behind the anterior border. Posterior cephalic prominences very well developed, both upward and backward, in such a way as to significantly modify the outline of the head when viewed from the dorsal side (Figs. 1 and 2). Surface of the head between the two posterior prominences forming a carinate dorsal projection (Figs. 1 and 2). Overall dorsal appearance of female as in Fig. 1. Overall dorsal appearance of male as in Fig. 2. Overall lateral appearance of female as in Fig. 3. Male genitalia shaped as in Fig. 9. Spermatheca shaped as in Fig. 10.

Measurements.—Pronotum length, 0.78–0.85 mm; elytra length, 0.60 mm; head length, 0.82–0.95 mm. Number measured, four.

Holotype male.—No. 9665, LIBERIA, CHARLESVILLE, 21 June 1962, from the central part of a raiding column of *Dorylus* (*Anomma*) *nigricans sjoestedti* Emery, nest No. 62, coll. D. H. and A. C. Kistner. In the collection of D. H. Kistner.

Paratypes.—One male, same data as holotype; two females, Liberia, Charlesville, 19 June 1962, from the central part of a raiding column of *Dorylus* (*Anomma*) *nigricans sjoestedti* Emery, nest No. 62, coll. D. H. and A. C. Kistner. All in the collection of D. H. Kistner.

Dorylocratus kisantuensis Kistner, new species

Distinguished from all other species by the shape of the posterior cephalic prominences and by the shape of the median posterior carina of the head between the two posterior cephalic prominences.

Color dark reddish brown throughout; abdomen somewhat darker, approaching black. Dorsal surface of the head, pronotum, and elytra with extremely fine bumps scattered sparsely and evenly over them except in the pronotal fossae where the fine bumps are closer together giving a duller overall appearance. Pronotum with a dark line running longitudinally along the midline; this line is darkest behind the fossae but can be traced forward to a point just behind the anterior border. Posterior cephalic prominences very well developed, both upward and backward in such a way as to significantly modify the outline of the head when viewed from the dorsal side; shaped as in *D. regina* Kistner (Figs. 4 and 5). Surface of the head between the two posterior prominences is smoothly rounded, without a carinate dorsal projec-

tion. Overall dorsal and lateral appearance of female very close to *D. regina* Kistner (Figs. 4 and 6). Spermatheca shaped as in *D. regina* Kistner. Male unknown.

Measurements.—Pronotum length, 0.78 mm; elytra length, 0.60 mm; head length, 0.84 mm. Number measured, one.

Holotype female.—No. 9199, CONGO REPUBLIC, KIVU, KISANTU, 3 January 1926, with *Dorylus* (*Anomma*) sp., coll. R. P. Hulstaert. In the collection of the Musée Royal de l'Afrique Centrale, Tervuren.

MORPHOLOGICAL NOTES ON THE GENUS

Most of the important morphological features of the genus were given by Seevers (1964). To his account I should like to add the following:

The wings were torn off of all specimens examined. The specimens were carefully handled both in the field and in the laboratory but when the elytra were raised only stumps of an otherwise normal wing were located. This suggests that they have full-sized wings at an early stage of their adult life, but these are lost during their life in the ant colony. Perhaps as in *Jeanneluisa* Bernhauer, they cannot be refolded under the elytra because of abdominal modifications and hence are soon lost when in contact with the ants.

The spermatheca is highly modified in this genus (see Figs. 8 and 10). The foot of the spermatheca is placed on the endosternite of segment VIII with the pointed part posterior. From each side of the pointed part is a membranous piece which extends laterally to the side of the abdomen. It is not clear to me just how this functions or if it functions as a spermatheca. It is simply located where the spermatheca is usually placed.

EXPLANATION OF FIGURE

Fig. 6. Lateral view of male *Dorylocratus rex* Wasmann. Square dots in the background have a side equal to 0.15 mm.

BEHAVIOR OF THE SPECIES

All of the species of the genus appear to be quite rare. An idea of how rare they are can be derived from the proportion of the total sample of myrmecophiles we took at each locality. At Yangambi, Congo Republic, *Dorylocratus rex* Wasmann was represented by 2 specimens out of about 13,000. In Charlesville, Liberia, *Dorylocratus regina* new species, was represented by 4 specimens out of about 1,800. These samples are about as objective as they can be as all the collectors were told to get every myrmecophile they saw. But if the sample is biased, it would be biased toward getting more *Dorylocratus* as they are relatively large in size, instantly recognizable in the columns, and perhaps the fanciest dorylophile to be found.

Dorylocratus rex Wasmann from the Congo Republic was collected first. The following protocols were recorded in our notebook about its behavior.

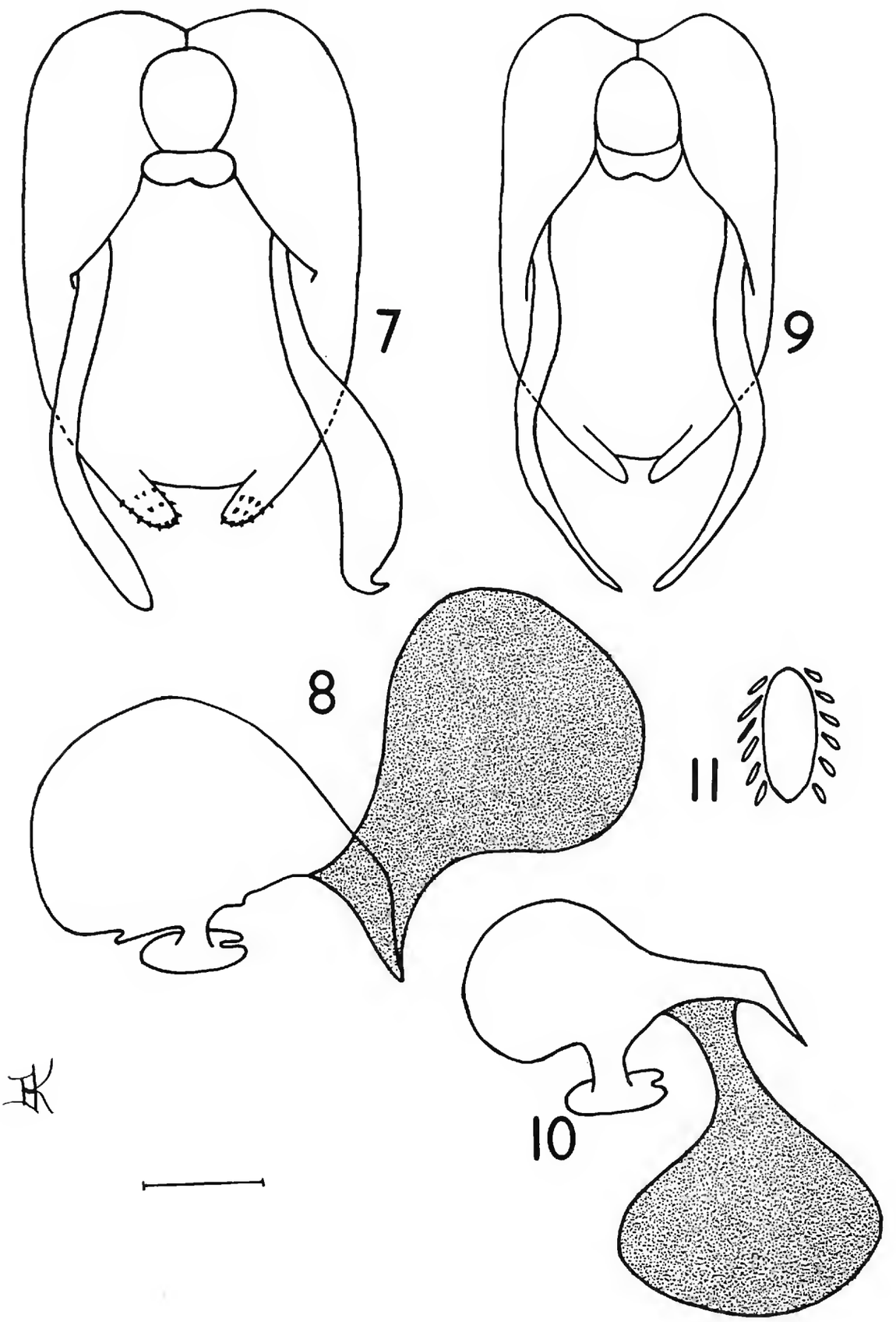
Yangambi, 27 June 1960, nest No. 14, emigration column, discovered that morning. By 2:00 p.m., the larvae and pupae had all been carried across the section of the column that I was working but the worker ants continued coming. Among these worker ants were large numbers of myrmecophiles. One large *Dorylocratus* was captured and another seen, but it escaped. Both progressed down the column surrounded by a crowd of minim workers which were all pushing forward and into the *Dorylocratus* at the same time (see diagram in Fig. 11). Although major workers were present in the column, they seemed to walk past the *Dorylocratus* without notice or change in pace. The minim workers seemed to take licks at the abdomen of the *Dorylocratus* and to move their antennae over their abdomen as they went walking by. The beetles progressed clumsily along in the columns.

Yangambi, 29 June 1960, nest No. 18, raiding column discovered early in the morning and collected from all day. The *Dorylocratus* was captured about 1:00 p.m. when the column was thick with workers returning to the nest with booty. The *Dorylocratus* came walking through the maze of ants going away from the nest. This specimen was not attended by a crowd of minim workers but was walking through without causing a ripple of excitement. Many ants would wave their antennae over the body and then continue on their way.

It is noteworthy at this point to state that the specimen captured on 27 June was a female and the specimen captured on 29 June was a male. Freshly killed specimens show a great deal of membrane surrounding the fimbriated edges of the abdomen. The abdomen is more inflated and the fimbriated edges of the abdomen show more membranous development in females than in males.

The other species observed was *Dorylocratus regina* Kistner from Liberia. The following protocols were recorded:

Charlesville, 19 June 1962, nest No. 62, raiding column which had started during the early morning and was well established when we dis-



covered it about 8:00 a.m. The *Dorylocratus* were captured around 10:00 a.m. walking out from the nest in a column in which many workers were returning with booty. Again both specimens captured were surrounded by about 10–15 minim workers which were pushing inward toward the *Dorylocratus* at the same time as they were moving forward. While the minim workers were moving they would move their antennae over the abdomen and move their mouthparts over the fimbriated margins of the sternites.

Charlesville, 21 June 1962, nest No. 62, another raiding column which had started before dawn and was well established when we found it about 8:00 a.m. One *Dorylocratus* was captured moving out from the nest in a column thick with returning workers carrying booty. This specimen was unattended by minim workers but was "felt" by the antennae of workers which it encountered. The second specimen was captured about 4:00 p.m. very near the nest when the raid was ending and all the workers were returning to the nest with or without booty. The *Dorylocratus* was returning to the nest also unaccompanied by the crowd of minim workers. This is a time when excitement within the column is at a low ebb and the *Dorylocratus* was walking along with scarcely an encounter with the ants.

It is noteworthy to state here that the two specimens captured on 19 June were females whereas the two specimens captured on 21 June were males.

In view of the above observations, the following interpretations are tentatively offered. If these were common insects, I should probably wait for more observations, but in view of the fact that only 13 specimens have been recorded in the last 50 years (three of these, which had been captured in Ethiopia by Patrizi and Meneghetti (Patrizi 1951), were lost during World War II), I would like to offer them anyway.

1. Specimens are to be found both in raiding columns and emigration columns. Although Patrizi (1951) recorded them only in association with the brood and emigration columns, Wasmann (1916, 1917) recorded them from raiding columns and our data show them in both situations.

2. The inflated abdomen with its membrane-covered, fimbriated edges

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← EXPLANATION OF FIGURES

Figs. 7, 9. Male genitalia, ventral views: 7, *Dorylocratus rex* Wasmann. 9, *D. regina* Kistner. Figs. 8, 10. Spermathecae (stippled area membranous): 8, *D. rex* Wasmann; 10, *D. regina* Kistner. Fig. 11. Diagram to show relations of a *Dorylocratus* sp. female to the minim worker ants as they progress through the column. The large ellipse represents the *Dorylocratus* and the small ones ants. They are progressing towards the top of the page. The scale represents 0.25 mm and applies to Figs. 7–10.

of the sternites probably has some secretory function. This function seems to be more developed in females than in males. The males, whose abdomens are less inflated than females, are more ant-like in appearance and seem to be able to pass antennal scrutiny without any obvious exudation.

3. Only minim workers were ever seen engaged in behavior which suggests that they were licking the beetles. Although major workers were abundant in the columns, they seemed to ignore the *Dorylocratus* altogether. We have data on other species (including an histerid) showing the same type of behavior which we shall publish later when determinations are available.

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